

A Miniature Compressor for In-Situ Resource Utilization on Mars, Phase I

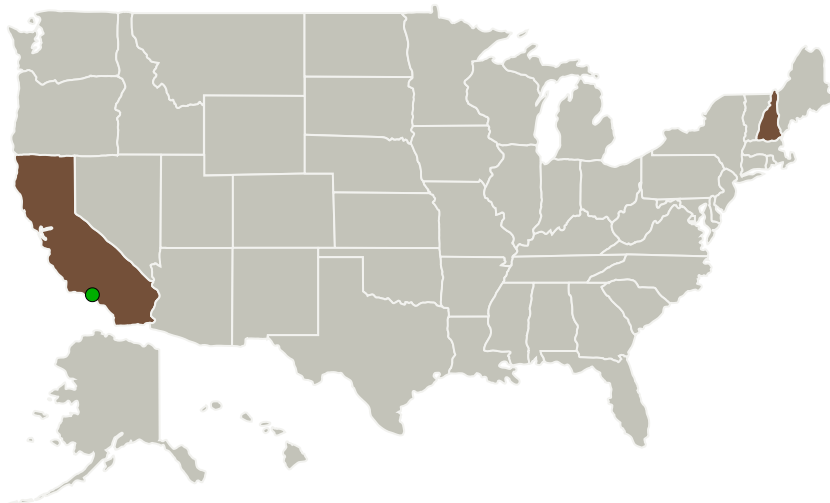
Completed Technology Project (2014 - 2014)




Project Introduction

A key objective for NASA's next rover mission to Mars is the demonstration of oxygen production from atmospheric carbon dioxide. Such a technology demonstration may pave the way for a future sample return mission to the Red Planet as well as possibly a future manned mission to Mars. A necessary component in such a demonstration system is a blower or compressor that can deliver the necessary carbon dioxide mass flow to a production plant. Creare proposes the development of a multistage radial flow compressor that is capable of compressing 400 g/hr to a pressure of up 0.1 Bar. The compressor will be a turbomachine based on our space-qualified vacuum pump technology currently operating on the Curiosity rover in Gale Crater on Mars. In Phase I, we propose to design the compressor and perform benchtop testing. In Phase II, we propose to design and build a full-up multistage system.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Creare LLC	Lead Organization	Industry	Hanover, New Hampshire
 Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



A Miniature Compressor for In Situ Resource Utilization on Mars Project Image

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Primary U.S. Work Locations

California

New Hampshire

Project Transitions



June 2014: Project Start



December 2014: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140603>)

Images



Project Image

A Miniature Compressor for In Situ Resource Utilization on Mars Project Image

(<https://techport.nasa.gov/image/128138>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Creare LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Paul H Sorensen

Co-Investigator:

Paul Sorensen

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Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.2 Electric Space Propulsion
 - └ TX01.2.1 Integrated Systems and Ancillary Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System